

REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections and further examination are requested. Upon entry of this amendment, claims 1 and 3 are amended and claim 15 is added, leaving claims 1, 3, 6-8, 10, and 13-15 pending with claims 1 and 3 being independent. No new matter has been added.

Rejections Under 35 U.S.C. §102(b)

Claim 1 has been rejected under 35 U.S.C. § 102(e) as being anticipated by Hayashi (WO 2004/038240).

Applicants submit that although Hayashi has been cited as a 102(e) reference, Hayashi, at best, should have been cited as a 102(a) reference. 35 U.S.C. §102(e) states that a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language. Emphasis added.

Applicants submit that WO 2004/038240 was not published in English, and therefore does not qualify as prior art under 35 U.S.C. §102(e). Since Hayashi, at best, should have been cited as a 102(a) reference, the effective date of Hayashi is the publication date or May 6, 2004.

To overcome this rejection, Applicants have filed a certified English translation of the Priority Document 2004-100032, filed March 30, 2004, which supports the subject matter of independent claim 1. Therefore, Applicants are entitled to the March 30, 2004 priority date, which is before the May 6, 2004 publication date of Hayashi. In light of the filing of the certified English translation, Applicants submit that Hayashi is not prior art, and thus, Applicants respectfully request that this rejection be withdrawn.

Claim 1 has been rejected under 35 U.S.C. § 102(e) as being anticipated by Takahashi (U.S. 2001/0022870).

Applicants submit that claim 1 as now pending is allowable over the cited prior art. Specifically, amended independent claim 1 recites a dynamic bearing device comprising a thrust bearing surface formed on one of a fixed-side member and a rotational-side member, the thrust

bearing surface including a dynamic pressure generating groove area having a plurality of dynamic pressure generating grooves being arranged thereon, wherein each of the dynamic pressure generating grooves has a spiral shape, an outer-diameter end and a groove width, and for each dynamic pressure generating groove of the dynamic pressure generating grooves, the groove width increases as the dynamic pressure generating groove extends radially outwardly toward an outer periphery of the thrust bearing surface such that a largest dimension of the groove width is disposed at the outer-diameter end.

This structure enables the device to be easily manufactured at a low cost with high accuracy (e.g., grooves having a constant depth). Additionally, this structure enables the pumping power of the dynamic pressure generating grooves in a peripheral portion of the thrust bearing surface to be increased, even though the thrust bearing gap adjacent this portion of the thrust bearing surface is smaller than where adjacent other portions due to the inclined plane formed on the end face of the flange. Moreover, since the portion of the gap having the largest rotational speeds has the least amount of space between the flange and the shaft member, a large volume of fluid is disposed at the center position (i.e., the portion having relative low rotational speeds), enabling control of the contact start rotational speed at a low speed.

The cited prior art fails to disclose or render obvious such a device. In particular, Takahashi discloses a thrust dynamic pressure bearing including a rotor 1 and a housing 2. The rotor 1 is accommodated in a hermetically sealed housing 2, and forms gaps 3 and 4 between the inner periphery of the housing 2 and the rotor 1. V-like or herringbone-like thrust dynamic pressure generating grooves 11 are formed in an upper end face 1a of the rotor 1. However, there is no disclosure in Takahashi of grooves 11 having a groove width that increases as the groove extends radially outwardly toward an outer periphery of the thrust bearing surface such that a largest dimension of the groove width is disposed at an outer-diameter end, as recited in independent claim 1 of the present application. In fact, Takahashi discloses grooves 11 that have a constant width, which would increase manufacturing costs and would fail to exert sufficient pumping power in the outer peripheral portion. *See* Fig. 1(b) of Takahashi.

Moreover, there is no reasoning in the prior art to modify Takahashi such that it would have rendered independent claim 1 obvious. Any such reasoning would have involved improper hindsight. Therefore, Applicants submit that independent claim 1 is allowable over Takahashi.

Rejections Under 35 U.S.C. §103(a)

Claims 3, 7, 10 and 14 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Takahashi (US 2001/0022870) in view of Nakagawa (US 2002/0172438), and further in view of Takanobu (JP 02-278007).

Applicants submit that the claims as now pending are allowable over the cited prior art. Specifically, amended independent claim 3 recites a dynamic bearing device comprising an end face of a flange portion that faces a thrust bearing gap and is formed of a resin, and at least a part of the end face of the flange portion facing the thrust bearing gap is formed as an inclined plane, the inclined plane being inclined so as to approach the opposed end face of the thrust bearing portion in a radially outward direction, an inner shaft portion and the flange portion being integrally formed of a resin, an axial thickness of the resin of the inner shaft portion being thicker than the flange portion on an outer diameter side of the flange portion, and a shaft portion configured such that when the shaft portion is disposed in a bearing sleeve, the outer peripheral face of the shaft portion faces a radial bearing gap between the shaft portion and the bearing sleeve, and the outer peripheral surface of a flange portion is disposed radially farther from the longitudinal axis of a shaft member than the outer peripheral face of the shaft portion.

Applicants submit that the cited prior art fails to disclose or render obvious such a device. In particular, as discussed above, Takahashi discloses a thrust dynamic pressure bearing including a rotor 1 and a housing 2. The rotor 1 is accommodated in a hermetically sealed housing 2, and forms gaps 3 and 4 between the inner periphery of the housing 2 and the rotor 1. The Examiner suggests that Takahashi includes an inclined plane (*see* Fig. 6) as recited in independent claim 3 of the present application. The Examiner recognizes that Takahashi fails to disclose a flange portion being integrally formed of a resin, an axial thickness of the resin of the inner shaft portion being thicker than the flange portion on an outer diameter side of the flange portion. For this element, the Examiner relies on Nakagawa.

Nakagawa discloses a rotary shaft 6A having an inner peripheral surface 51 and a pipe 61, which is disposed in the rotary shaft. The Examiner states that pipe 61 corresponds to the outer shaft portion and resin member 62 corresponds to the flange and inner shaft portion recited in independent claim 3. The only way that Nakagawa could meet this limitation is if the Examiner is suggesting that the outer peripheral portion that tapers upwardly in Nakagawa is has

an axial thickness that is thinner in the axial direction than the portion of flange 62 disposed inside of pipe 61.

Applicants submit that one of ordinary skill in the art would not have modified Takahashi in this manner, since such a modification would have rendered Takahashi inoperative for its intended purpose. That is, as discussed in para. [0029] of Takahashi, “gap 14 between an end face 10a of the flange 10f and a receiving face 20a of the housing 20 is formed to be smaller (narrower) as moving toward a radially outer side. In this case, at start of rotation, negative-pressure suction is greater as moving to the outer side where the gap is narrower, and hence the working fluid easily flows from the recess 16 into the gap, so that a trouble due to an insufficient amount of the working fluid hardly occurs.” Emphasis added. Thus, modifying Takahashi (i.e., to have an upwardly tapered surface on flange 10f) as suggested by the Examiner would cause insufficient working fluid to flow from the recess 16, since the gap would widen rather than narrow.

Additionally, Applicants submit that Nakagawa resin member 62 does not have an outer peripheral surface that is disposed radially farther from the longitudinal axis of a pipe 61 than the outer peripheral face of the pipe. Thus, Nakagawa fails to disclose that an outer peripheral surface of a flange portion is disposed radially farther from the longitudinal axis of a shaft member than an outer peripheral face of the shaft portion, as cited in independent claim 3.

Moreover, Takanobu fails to overcome the deficiencies of Takahashi and Nakagawa.

For at least the reasons set forth above, Applicants submit that independent claim 3 and its dependent claims are allowable over the cited prior art.

Claim 6 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Takahashi as applied to claim 1.

Applicants submit that since claim 6 is dependent from claim 1, claim 6 is allowable for the reasons set forth above.

Claims 8 and 13 are rejected under 35 U.S.C. §103(a) as being unpatentable “over anticipated as applied to claim 1 above”, and further in view of Nakagawa. Applicants assume that this is a typographical error and claims 8 and 13 are rejected as being unpatentable over Takahashi further in view of Nakagawa.

Applicants submit that since each of these claims is dependent from claim 1, and since

Nakagawa fails to overcome the deficiencies of Takahashi claims 8 and 13 are allowable for the reasons set forth above.

New Claim

New claim 15 is allowable for the reasons set forth above, since it is dependent from claim 1. Moreover, claim 15 recites that the inner shaft member extends along substantially the entire length of the outer shaft member. The cited prior art clearly fails to disclose or render obvious this claim element.

Conclusion

In view of the foregoing amendments and remarks, all of the claims now pending in this application are believed to be in condition for allowance. Reconsideration and favorable action are respectfully solicited.

Should the Examiner believe there are any remaining issues that must be resolved before this application can be allowed, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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